CLAIMS

1. An inductive energy harvester that generates electrical energy from mechanical vibrations, the energy harvester comprising:

a magnetic field source having a first pole and a second pole that generate a magnetic field;

an induction coil;

an induction coil support that positions the induction coil near the first magnetic field source pole; and

a mechanical connector that mechanically couples the magnetic field source to the induction coil support in a manner that allows relative movement between the magnetic field source and the induction coil in response to the vibrations.

2. The inductive energy harvester of claim 1 further comprising:

a flux concentrator attached to the first pole in order to concentrate the magnetic field emerging from the first pole in the vicinity of the induction coil.

3. The inductive energy harvester of claim 1 wherein the mechanical connector comprises a spiral disk spring.

4. The inductive energy harvester of claim 1 wherein the mechanical connecter comprises a pair of spiral disk springs.

5. The inductive energy harvester of claim 1 wherein the mechanical connector comprises at least one leaf spring.

6. The inductive energy harvester of claim 1 wherein the mechanical connector comprises at least one coil spring.

7. The inductive energy harvester of claim 1 further comprising a flux yoke attached to the second magnetic field source pole to provide a low reluctance flux path between the first and second magnetic field source poles.

8. The inductive energy harvester of claim 7 wherein the flux yoke surrounds the magnetic field source.

9. The inductive energy harvester of claim 7 wherein the mechanical connector attaches to the flux yoke.

10. The inductive energy harvester of claim 9 further comprising a non-magnetic housing and wherein the mechanical connecter attaches to the housing.

11. The inductive energy harvester of claim 7 wherein the flux yoke is a magnet having a polarization that enhances magnetic flux in the vicinity of the induction coil.

12. The inductive energy harvester of claim 11 wherein the flux yoke comprises an annular permanent magnet.

13. The inductive energy harvester of claim 1 wherein the induction coil surrounds one pole of the magnetic field source.

14. The inductive energy harvester of claim 1 wherein the magnetic field source is a permanent magnet.

15. The inductive energy harvester of claim 1 further comprising a second magnetic field source arranged in magnetic flux opposition to the magnetic field source.

16. The inductive energy harvester of claim 15 further comprising a magnetic flux concentrator positioned between the magnetic field source and the second magnetic field source and in the vicinity of the induction coil.

17. An inductive energy harvester that generates electrical energy from mechanical vibrations, the energy harvester comprising:

a permanent magnet having a first pole and a second pole that generates a magnetic field;

a flux concentrator attached to the first pole;

an induction coil surrounding the flux concentrator;

a spring that mechanically couples the permanent magnet to the induction coil in a manner that allows relative movement between the permanent magnet and the induction coil in response to the vibrations.

18. The inductive energy harvester of claim 17 wherein the flux concentrator is comprised of a high magnetic permeability material.

19. The inductive energy harvester of claim 17 further comprising a magnetically permeable flux yoke extending from the second pole to the first pole.

20. The inductive energy harvester of claim 19 wherein the flux yoke is an annular permanent magnet with a polarization that enhances magnetic flux in the vicinity of the induction coil.

21. The inductive energy harvester of claim 19 wherein the flux yoke surrounds the permanent magnet.

22. The inductive energy harvester of claim 19 further comprising a non-magnetic housing and wherein the spring attaches the housing to the flux yoke.

23. The inductive energy harvester of claim 22 further comprising a second spring attached between the flux yoke and the housing.

24. The inductive energy harvester of claim 17 wherein the spring is a spiral disk spring.

25. The inductive energy harvester of claim 17 wherein the spring is a leaf spring.

26. The inductive energy harvester of claim 17 wherein the spring is a coil spring.

27. An inductive energy harvester that generates electrical energy from mechanical vibrations, the energy harvester comprising:

a first permanent magnet having a first pole and a second pole that generates a magnetic field;

a second permanent magnet having a first pole in opposing flux relationship with the first permanent magnet first pole and a second pole;

a flux concentrator attached to the first permanent magnet first pole and positioned between the first permanent magnet and the second permanent magnet;

an induction coil surrounding the flux concentrator;

a spring that mechanically couples the first and second permanent magnets to the induction coil in a manner that allows relative movement between the first and second permanent magnets and the induction coil in response to the external vibrations.

28. The inductive energy harvester of claim 27 wherein the flux concentrator is comprised of a high magnetic permeability material.

29. The inductive energy harvester of claim 28 further comprising a flux yoke extending from the first permanent magnet second pole to the second permanent magnet second pole.

30. The inductive energy harvester of claim 28 wherein the flux yoke surrounds the first and second permanent magnets.

31. The inductive energy harvester of claim 29 further comprising a non-magnetic housing and wherein the spring attaches the housing to the flux yoke.

32. The inductive energy harvester of claim 31 further comprising a second spring attached between the flux yoke and the housing.

33. The inductive energy harvester of claim 27 wherein the spring is a spiral disk spring.

34. The inductive energy harvester of claim 27 wherein the spring is a leaf spring.

35. The inductive energy harvester of claim 27 wherein the spring is a coil spring.